NOTE XV.

A MONOGRAPH OF THE GENUS CUSCUS.

BY

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A rare constancy in color of the fur in some species, a nearly endless variety in other species and a very peculiar geographical distribution render the study of this beautiful group of Marsupials very difficult but at the same time highly interesting and attractive. A thourough study based upon large and well selected series from the most different and distant localities is the only way to surmount the very difficulties. No wonder therefore that so many naturalists have failed in their efforts to recognize and circumscribe the species composing this group.

The *Cuscus*-species have half or more than half the prehensile tail destitute of hair and the second and third toes of the hind feet united in a common integument very nearly to the extremity. These two characters combined distinguish them from all the other Mammals.

In two species (*Cuscus celebensis* and *Cuscus orientalis*) the ears are externally clothed with hairs, internally naked; the two other species (*Cuscus ursinus* and *Cuscus maculatus*) have the ears externally and internally clothed with hairs. In one species, *Cuscus maculatus*, the sexes are differently colored and the females larger than the males; in another, *Cuscus orientalis*, have the individuals a dark line on the middle of the back and are the males larger than the females, meanwhile the other species have no spots or band on the back.

So the species may shortly be characterized as follows:

Ears naked internally,

1. back with a dark band; males larger than females: *Cuscus orientalis.*
2. no differences in color or size between males and females: *Cuscus celebensis.*

Ears clothed internally,

3. males spotted, smaller than females: *Cuscus maculatus.*
4. no difference in color or size between males and females: *Cuscus ursinus.*

The form of the skull permits to distinguish two types, the one by a convexe, the other by a concave forehead. *Cuscus maculatus* is the only representant of the first type, having a very swollen forehead; the three other species belong to the second type, although in different degrees, viz: the concavity of the forehead is the deepest in *Cuscus orientalis*, meanwhile in *Cuscus celebensis* it remembers the state of a not fullgrown *Cuscus orientalis*; this concavity is the less deep in *Cuscus ursinus* and here the foremost parts of the forehead form swollen cushions. In very young specimens already the specific form of the forehead is pronounced, the only differences between young and adult being that in young ones the concavity or convexity is less developed and that the crest along the middle of the occiput in fullgrown individuals is in the younger ones represented by two crests: these two crests arise in very young specimens from the sides of the occiput, in growing they approach one another, come together and finally unite into a single elevate crest, which ends at the beginning of the concavity or convexity on the forehead. The named crest is only well developed in perfectly adult specimens, some time after the whole development of the hindmost molars. In our large series of skulls belonging to mounted specimens of all ages this process is to demonstrate on the most decisive way. Some specimens become the dentition complete at a very advanced age and attain a larger size than other specimens; our although large collection is however too small to decide whether these differences are constant to certain localities (islands) or are caused by the influence of temperature or food and independent from locality. The different degrees of development of the occipital crest have seduced some authors to regard not fullgrown specimens as distinct species.

Passing over the shape of the nasalia, which is constantly distinct in the different species, and other osteological details I will fix the attention upon the premolars as they show some particularities, especially in the specimens of *Cuscus orientalis* and *Cuscus maculatus. Cuscus orientalis* has three (of which one small) premolars in each upper-, and four (of which three small) in each lower jaw, meanwhile *Cuscus maculatus* wants the midmost (the small!) upper premolar and has three lower premolars (of which two small). There are in the named two species several abnormalities as to the number of the small premolars, so that although there are no differences in the form of the skull or in the shape or number of the other teeth, some specimens have one or more small premolars too less or too much. This fact has been observed by Waterhouse, Gray, Alston and other naturalists, but it was impossible to decide what was the normal number and what abnormal, because they had no large series at their disposal. Among our number of sixty skulls of *Cuscus orientalis* I find a number of seventeen, which present abnormalities in the dentition: four have no trace of midmost upper premolar, viz: N°. 121 (skull of N°. 57), N°. 138 (skull of N°. 79), N°. 141 (skull of N°. 82) and N°. 142 (skull of N°. 83); two have no midmost left upper premolar, viz: N°. 137 (skull of N°. 78) and N°. 143 (skull of N°. 84); one has no midmost right upper premolar, viz: N°. 147

(skull of N⁰. 88); one has in each upper jaw two small premolars instead of one, viz: N⁰. 104 (skull of N⁰. 36); these spurious teeth are very small and sharply pointed. A skull, N⁰. 139 (of N⁰. 80) has a single small right lower premolar and two small left lower premolars; two have two small premolars in each lower jaw, viz: N⁰. 111 (skull of N⁰. 43) and N⁰. 148 (a not fullgrown from Reinwardt's voyage); two have two small right lower premolars, viz: N⁰. 109 (skull of N⁰. 41) and N⁰. 121 (skull of N⁰. 57); two have two small left lower premolars, viz: N⁰. 126 (skull of N⁰. 66) and N⁰. 140 (skull of N⁰. 81); two have four small right lower premolars, viz: N⁰. 147 (skull of N⁰. 88) and N⁰. 149 (a halfgrown from Banda); one has four small left lower premolars, viz: 119 (skull of N⁰. 53); finally one has five small right and four small left lower premolars, viz: N⁰. 104 (skull of N⁰. 36): I remember that this skull has in each upper jaw two small premolars instead of one small premolar (see above).

Among forty skulls belonging to mounted specimens of *Cuscus maculatus* there are fifteen in an abnormal condition as to the dentition: one, viz: N⁰. 55 (skull of N⁰. 5) has in each upper jaw two incisors instead of three, and in the left upper jaw only the hindmost premolar and no trace of the two others; two, viz: N⁰. 84 (skull of N⁰. 39) and N⁰. 86 (skull of N⁰. 43) have in each upper jaw a small and pointed premolar placed between the two other premolars, and in each lower jaw three small premolars, instead of two: these spurious premolars are placed very close to the hindmost lower premolars; one, viz: N⁰. 74 (skull of N⁰. 26) has in the right upper jaw a small premolar placed between the two others; three, viz: N⁰. 76 (skull of N⁰. 29), N⁰. 80 (skull of N⁰. 34) and N⁰. 82 (skull of N⁰. 37) have in each upper jaw a small premolar placed between the two other premolars like in *Cuscus orientalis*: two, viz: N⁰. 58 (skull of N⁰. 8) and N⁰. 91 (skull of N⁰. 48) have only one small premolar in each lower jaw; two, viz: N⁰. 65 (skull of N⁰. 16) and N⁰. 89

(skull of N⁰. 46) have only one small premolar in the right lower jaw; three, viz: N⁰. 54 (skull of N⁰. 3), N⁰. 63 (skull of N⁰. 14) and N⁰. 76 (skull of N⁰. 29) have only a single small premolar in the left lower jaw; one, viz: N⁰. 74 (skull of N⁰. 26) has three small premolars in the left lower jaw; one, viz: N⁰. 80 (skull of N⁰. 34) has three small premolars in the right lower jaw; two, viz: N⁰. 81 (skull of N⁰. 35) and N⁰. 82 (skull of N⁰. 37) have three small premolars in each lower jaw; in two, viz: N⁰. 56 (skull of N⁰. 6) and N⁰. 61 (skull of N⁰. 11) the hindmost incisor of the right upper jaw is wanting; finally in N⁰. 63 (skull of N⁰. 14) five of the upper incisors are wanting (see above as to the lower jaws of this skull). In the skull of a skeleton (N⁰. 153) of a nearly fullgrown individual there is in the right upper jaw no trace of the small premolar.

An adult skeleton (N⁰. 8) belonging to a specimen of *Cuscus ursinus* and presented to our Museum by the Groningen-Museum has only one small premolar in each lower jaw.

Our skulls of *Cuscus celebensis* present no peculiarities or abnormalities.

Two of the species, *Cuscus ursinus* and *Cuscus celebensis* are exclusively restricted to Celebes, perhaps solely to the northern part of that island, meanwhile the two other species have a very wide geographical distribution: *Cuscus orientalis* has been met with from Timor to the Salomon-islands and New-Zealand (if Gray's statements are to be trusted) and from Morotai to the Arou-islands and New-Guinea; *Cuscus maculatus* from the Saleyer-islands to the Echiquier-group and Dufour-island and from Waigeou to the northern part of Australia, Cape York and neighborhood. *Cuscus orientalis* and *Cuscus maculatus* hitherto have not been found in Celebes. The Group of Halmahera seems to be only inhabited by *Cuscus orientalis*, like Timor and Banda. Further investigations must make out how far the here and below given oversight of the geographical distribution must be changed to become a clear and trusty idea as to this very important matter: just than it will be time to make scientific conclusions and so the door will be closed to vagous speculations and hypotheses without fixed base.

Quoy and Gaimard report: »Ces animaux (les Phalan»gers), que les naturels nous apportoient pour être mangés, »semblent remplacer ici les paresseux de l'Amérique. Stu»pides comme eux, ils passent une partie de leur vie dans »l'obscurité; et lorsque trop de lumière les fatigue, ils s'y »soustraient en se blotissant la tête entre les jambes. Ils »ne sortent de cette position que pour manger, ce qu'ils »font avec beaucoup d'avidité. Dans les bois, ils se nour»rissent de fruits aromatiques, comme nous l'avons véri»fié; et à défaut, les nôtres dévoroient de la chair crue. »Leur peau est tellement fine et tendre [1]) qu'en se battant »ils s'en arrachoient des lambeaux. La même chose arrivoit, »lorsque se fixant à l'aide de leurs griffes aiguës, on vou»loit les enlever de force par leur fourrure. Ordinairement, »deux de ces animaux habitués dans une même cage, »vivoient en bonne intelligence: en ajoutoit-on un troisième, »ils se battoient à outrance en grognant et poussant des »cris perçans."

Wallace mentions in his *Malay Archipelago*: »They live »in trees, feeding upon leaves, of which they devore large »quantities. They move about slowly, and are difficult to »kill, owing to the thickness of their fur, and their te»nacity of life. A heavy charge of shot will often lodge »in the skin and do them no harm, and even breaking »the spine or piercing the brain will not kill them fore »some hours. The natives everywhere catch them by »climbing; so that it is wonderful they have not been

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1) That the skins of the *Cuscus*-specimens are extraordinarily thin and tender we know by experience, for nothing is more rare than a skin without cracks, and a well stuffed specimen is an exception because the skin nearly always has lost its extensibility.

»exterminated. It may be, however, that their dense woolly »fur protects them from birds of prey, and the islands they »live in are too thinly inhabited for man to be able to »exterminate them."

Dr. Mohnike [1]) observes: »Den Tag bringen diese Thiere »auf Bäumen sitzend zu, wo Laub und Zweigen sie nicht »leicht erkennen lassen. An einigen Orten, wie z. B. auf »der Insel Amboina, kommen sie in ausserordentlicher »Menge vor und bilden eine Lieblungsnahrung der eingeborenen Bevölkerung. In den Monaten Mai und Juni »sind sie so fett, dass häufig, wie ich selbst gesehen habe, »bei dem Niedersturze eines aus dem Baume herabgeschossenen Kuskus auf die Erde, das Fell desselben platzt. »Die Zeit wo die Beutelratten am fettesten sind, trifft mit »der Reife der Früchte von *Durio zibethinus* zusammen. »Alsdann lebt die Bevölkerung von Amboina, wie sich »ohne Uebertreibung behaupten lässt, fast ausschliesslich »von den genannten Früchten und dem Fleische jener Thiere. »Europäer dagegen machen hiervon niemals Gebrauch. Wenn »die Phalangisten in sich zusammen gekauert auf einem »Baumast sitzen und um Diesen das Ende ihres langen »Schwanzes geschlungen haben, erinnern sie einigermassen »an Katzen."

Cuscus orientalis.

1766. *Didelphis orientalis* Pallas. Misc. Zool. p. 59.

1803. *Phalangista alba* Is. G. St. Hilaire. Catalogue du Muséum. p. 148; *Phalangista rufa* I. G. St. H. l. c. p. 149.

1826. *Cuscus albus* Lesson et Garnot. Voyage de la Coquille. Zoologie. I. p. 158. pl. VI.

1827. *Phalangista cavifrons* Temminck. Mammalogie. T. I. p. 17. Pl. I, figs. 7, 8, 9; Pl. II, figs. 6, 7, 8, 9, 10; Pl. III, fig. 6.

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1) Blicke auf das Pflanzen- und Thierleben in den Niederländischen Malaienländern. 1883.

1846. *Phalangista (Cuscus) orientalis* Waterhouse. Marsupiata. Vol. I. p. 279.
1858. *Cuscus celebensis* Gray. P. Z. S. L. p. 105. Pl. LXII (partim); *Cuscus orientalis* Gray. l. c. p. 104. Pl. LXI.
1860. *Cuscus ornatus* Gray. P. Z. S. L. p. 1. Pl. LXXIV.
1861. *Cuscus (Strigocuscus) celebensis* Gray. P. Z. S. L. p. 319 (with two woodcuts of the skull of a not fullgrown *Cuscus orientalis*); *Cuscus ornatus* Gray. l. c. p. 320 (with two woodcuts of the skull of an adult *Cuscus orientalis*); *Cuscus orientalis* Gray. l. c. p. 320.
1875. *Phalangista (Cuscus) gymnotis* Peters et Doria. Ann. Mus. civ. Genova. Vol. VII. p. 513.
1877. *Cuscus vestitus* A. Milne Edwards. Compt. rend. p. 1080.
1881. *Phalangista (Cuscus) gymnotis* Peters et Doria. Ann. Mus. civ. Genova. Vol. XVI. p. 19. Tav. VIII—IX, fig. 3; Tav. XIV.

Sexes *not* differently colored; a dark band on the middle of head and back [1]). Ears large, produced beyond the fur, externally clothed with hairs, internally naked; a tuft of white hairs near the base of the posterior margin of the earconch. Dental formula: I. $\frac{3}{1}$, C. $\frac{1}{0}$, P. $\frac{3}{4}$, M. $\frac{4}{4}$.

It is a very singular phenomenon that the males of this species have a certain tendency to albinisme. I nowhere found a description or notice as to a white female-specimen. In our large collection embracing a number of ninety individuals there are but ten white specimens and these ten are males. The other males are exactly colored like the females; the dark band on head and back is common to both sexes and to all ages [2]), even it is to see

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1) Alston (P. Z. S. L. 1878. p. 275) observes: „the dorsal stripe is sometimes absent". I believe it to be a very constant character and never saw a *Cuscus orientalis* without this stripe (some albinos excluded).

2) Temminck says in his Mammalogie I. p. 18: „Les embryons sont déjà reconnaissables aux indices que fournit la raie unique".

more or less distinctly in some albinos. The color of the remaining parts of head and back varies from dirty yellow to reddish, reddish brown and brown, sometimes closely spotted or with a few spots, mostly destitute of spots; the underparts are pure white, yellow or reddish. They rarely attain the large size of *Cuscus ursinus* and *Cuscus maculatus*; the females are generally smaller than the males [1]), contrasting with what is rule in the specimens of *Cuscus maculatus.*

The albinos of this species long time have puzzled the naturalists. So Temminck related; »la robe des mâles, même dans le premier âge, est d'un blanc parfait sur toutes les parties; les adultes ont une teinte plus jaunâtre, et les jeunes sont d'un blanc de lait." Waterhouse was of exactly the same opinion. Schlegel wrote in 1857: »the adult males are perfectly white". In 1858 Gray described the male white, the female pale reddish-brown, with a darker longitudinal streak. The same author wrote (P. Z. S. L. 1860): »*Cuscus ornatus* is most like *Cuscus orientalis*, but in that animal the male is pure white." In the following year however Gray asked: »can the white males be an *albino variety*, and confined to the male sexe?" Schlegel [2]) endeavouring to solve the question stated: »young and adult females are of a brownish color: the adult males however generally grow pure white: whereas this is a rule in the individuals from Ceram and Amboina, the specimens from other localities present several differences in color and are more or less spotted, the males as well as the females."

At present we know that the white individuals are *albinos* and that they are not restricted to Ceram and Amboina, but independently from locality as we have albinos from Ceram, Amboina, Boeroe, Soela-bessie and Goram, Gray cited albinos from Ceram, Amboina, Waigeou, New-

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1) The contrary of what has been observed by Waterhouse: see his Marsupiata. I. p. 280.

2) De Dierentuin Natura Artis Magistra te Amsterdam. 1872. p. 165.

Ireland and New-Zealand, moreover *Cuscus albus* Lesson et Garnot came from New-Ireland.

The question however was settled by François Valentyn long before the birth of Pallas, Temminck, Waterhouse Gray and Schlegel. François Valentyn very exactly described in 1726 this species from Amboina under the name *Coescoes*; he said that sometimes, but always rarely, there are pure white individuals, and these white specimens always are adult males and have red eyes, meanwhile the eyes of the other specimens are blue with a few red round the eye-ball, a. s. o. Valentyn extremely well knew the habits of this species, and its behavior, the way to procure it used by the indigenous, that it is a food, and he described the medical use of tail and claws, a. s. o. Finally Valentyn figured it (very badly). Pallas translated Valentyn's description (Valentyn's book is written in Dutch) in Latin and called the species *Phalangista orientalis.*

Although Is. G. St. Hilaire cited Valentyn and Pallas, it is clear that he misunderstood those authors or perhaps never consulted their works, otherwise he would not have described a white colored specimen as a distinct species (*Phalangista alba*). Moreover he cited »Pallas, Misc. Zool. p. 62, *Didelphis forte africana*", meanwhile on p. 62 there is question of »*Didelphidis opossum* varietas *orientalis* (*Macropus brunii*) from Arou, and I believe that Pallas in his Misc. Zool. nowhere has given a name to an African *Didelphis (Phalangista).* Is. Geoffroy's *Phalangista rufa* is a female-specimen of *Cuscus orientalis*, with an excellent description.

Temminck's *Phalangista cavifrons* was called so after the peculiar concave forehead. It is not very clear for what reason Temminck did not accept Pallas' specific-title.

The specimens from St. Cristoval united by Gray with his *Cuscus* (*Strigocuscus*) *celebensis* belong without question to *Cuscus orientalis* as the two woodcuts of the skull demonstrate. Gray's *Cuscus ornatus* is nothing else as the spotted variety of *Cuscus orientalis*: we possess individuals from Batchan, Morotai and other localities more or less agreeing with Gray's description of *Cuscus ornatus*. The skull figured P. Z. S. L. 1861. p. 321 agrees evidently with other skulls belonging to fullgrown specimens of *Cuscus orientalis*.

Phalangista (Cuscus) gymnotis Peters e Doria is a perfectly adult male of *Cuscus orientalis* as the figures of the animal and of its skull and the description prove. All the differences summed up by the authors are of a mere individual value and we have skulls of *Cuscus orientalis* (adult specimens) from different localities agreeing exactly with the skull of *Cuscus gymnotis*. The number of vertebra and ribbs corresponds entirely with that in *Cuscus orientalis*. The three varieties of *Cuscus orientalis* distinguished by Peters and Doria (Ann. Mus. Civ. 1881. p. 681) are in no way bounded to distinct localities as the named author seem to believe; the description of our specimens will demonstrate that the same modification in the coloring appears in specimens from very distant localities.

Prof. Milne Edwards' description of *Cuscus vestitus* from the Karons-Mountains (New-Guinea) is applicable to several not fullgrown specimens of *Cuscus orientalis* in our collection and I do not hesitate in regarding it synonymous with this species.

The skeleton presents 13 costales, 6 lumbares, 2 sacrales and 28 caudales. There are in our collection nine skeletons of adult and young specimens and about sixty skulls belonging to differently aged specimens of the species under consideration. For details see the discussion on page 89.

Hab: Timor (Macklot). Letti (Barchewitz). Banda (Semmelink). Ceram (Forsten, von Rosenberg, Wallace, Teysmann). Saparoea (Forsten). Amboina (Müller and Macklot, Hoedt, Teysmann). Boeroe (Hoedt, Teysmann). Soela bessie (Hoedt, Teysmann). Obi (Bernstein). Halmahera (Bernstein, Museum Genoa). Batchan (Bernstein, Wallace). Ternate (Bernstein, Wallace, von Rosenberg, van Musschenbroek). Morotai (Bernstein). Guebeh (Bernstein). Misool (Hoedt,

v. Rosenberg). Waigeou (Wallace, v. Rosenberg). Salawatti (von Rosenberg). Batanta (von Rosenberg). New-Guinea (v. Rosenberg, d'Albertis, Laglaize). Jobi or Jappen (von Rosenberg, Museum Genoa). Soëk (von Rosenberg). Mefoor (von Rosenberg). Mysore (Museum Genoa). Goram (von Rosenberg). Key-islands (von Rosenberg, Museum Genoa). Arou-islands (Wallace), Wonoembai (von Rosenberg), Gialu Lengan (Beccari). Duke of York-island (Brown). New-Ireland (Brown). Salomon-islands: St. Cristoval (John Macgillivray and T. M. Rayner). New-Zealand (Verreaux, after Gray: see P. Z. S. L. 1861. p. 320).

Valentyn reports that the indigenous name in Amboina is *Coessoe* — the Dutch call it *Coescoes* — a name given by the Malays also to a species of very sharp grass, the seeds of which adhere to the clothes of the passengers: this seed therefore is entitled *woodlouse* (boschluis). Unde nomen.

Lesson and Garnot relate: »nommé *Kapoune* par les nègres insulaires de la Nouvelle Irlande, ce couscous y paraît extraordinairement commun; car les naturels nous en apportaient chaque jour un grand nombre. Il vit sur les arbres; et, malgré le soin avec lequel il s'y cache, une odeur fétide, fragrante et très-expansible, le décèle au loin [1]. Souvent en parcourant les forêts séculaires de cette île immense, l'odorat était vivement affecté par ce singulier animal. M. Cuvier dit qu'en le fixant avec plus ou moins de constance sur la branche où il est cramponné par sa queue, il finit par tomber [2]. Ce serait donc de cette manière que les habitants du Port-Praslin prenaient ceux qu'ils nous apportaient journellement à bord, et qu'ils nous vendaient en vie, après leur avoir brisé les jambes, et passé dans la bouche un morceau de bois, afin sans doute de les empêcher de mordre. Les naturels de ce point du monde aiment passionnément la chair très-grasse du couscous blanc; c'est pour eux un régal délicieux dont ils sont friands, et ils se bornent à faire rôtir l'animal dans sa peau, avec le poil et sur les charbons ardents, après en avoir ôté seulement les intestins. Mais telle est son abondance, qu'ils façonnent avec ses dents de longs chapelets, qui servent à la décoration de leurs armes; ou ils s'en font des colliers et des ceintures, longues de plusieurs brasses."

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[1] Mentioned also by Valentyn, and by Barchewitz (1751) à propos the couscous found by him in the Island Letti (vide Lesson et Garnot).

[2] Mentioned also by Valentyn.

Teysmann wrote on the labels that it is called *Koesoe tigha* in Ceram and Amboina; in Amboina the albino is named *Koesoe poeti* (*poeti* signifies *white*).

According to Gray, Wallace attached to a specimen of this species the observation: »eats leaves and cocoa-nuts."

Von Rosenberg reports that it is called *Kiedo* in Goram, and further: »es wird vermittelst eines stark klebenden, aus dem Harze eines *Artocarpus* verfertigten Leimes häufig von den Eingeborenen lebend gefangen."

Mounted specimens in the Leyden Museum:

Timor: 1 and 2. Adult males. Macklot, December 1828 and May 1829. Crown of head, nape and back of a chestnut brown, turning in a dirty yellow towards the haunches, the legs, tail and head. Underparts yellowish white. — 3. Adult female. Macklot, Dec. 1828. Like N°s. 1 and 2, but haunches and legs browner, underparts whiter, red round the pouch. — 4. Young male. Macklot, Dec. 1828. The very long and woolly fur of a uniform dirty white color; no trace of a dark line on back or head. *Albino.* — 5. Young male. Macklot, May 1829. Upperparts reddish brown, redder on the haunches and on the tail; underparts dirty white. — 6. Very young male. Macklot, May 1829. Upperparts chestnut brown, underparts whitish.

Banda: 7. Very young male. J. Semmelink, 1880. Upperparts, legs and tail sooty, underparts pure white.

Ceram: 8. Adult male. Pure white. No trace of dark band on back or head. *Albino.* 9. Adult female. Teysmann, 1877. The very woolly hairs of the upperparts chestnut brown with a silvery tinge, brownish mouse-color towards the legs, haunches and underparts, with the exception of a large patch on the foremost part of the abdomen and breast; this patch is pure white. Tail reddish brown; a circle round the pouch red.

Saparoea: 10. Young male. Forsten. Upperparts, legs and tail chestnut brown, underparts pure white.

Amboina: 11. Adult female. Macklot, 1828. Colored like N°. 5; red round the pouch. — 12 and 13. Adult females. Hoedt, May 1863 and June 1864. Colored like N°. 9. — 14. Adult female. Teysmann, 1877. Like N°s. 12 and 13. — 15. Adult male. Macklot, August 1828. Like N°. 4, but hairs short. — 16. Adult male. Hoedt, May 1863. *Albino;* a reddish brown semi-collar at the underpart of neck. — 17. Adult male. Hoedt, October 1863. *Albino*; like N°. 16, but a slight trace of the dark band on the back. — 18. Adult male. Teysmann, 1877. *Albino;* like N°. 16. — 19. Not fullgrown male. Teysmann, 1877. Upperparts of a fine brownish silvery tinge, underparts white; a semi-collar like N°. 16. — 20. Young female. Hoedt, March 1864. Of a darker brown than N°. 19. — 21 and 22. Halfgrown male and female. Teysmann, 1877. Upperparts dark mouse-color; underparts white. — 23 and 24. Young females. Hoedt, June 1863. Like N°. 9. — 25. Young female. Hoedt, May 1863. Like N°. 10. — 26. Young specimen. Teysmann, 1877. Colored like N°. 7. — 27 and 28. Young specimens. Teysmann, 1877. Upperparts reddish, underparts white. — 29 and 30. Young specimens. Teysmann, 1877. Like N°. 5, but underparts white. — 31 and 32. Very young females. Müller and Macklot, 1828. Colored like N°. 6.

Boeroe: 33 and 34. Adult and nearly fullgrown males. Hoedt, Sept. 1864. Colored like N°. 9; N°. 33 is somewhat redder tinged. — 35. Adult male. Teysmann, 1877. Of the same beautiful color like N°. 19. — 36 and 37. Adult males. Hoedt, January 1864 and Teysmann, 1877. *Albinos.* A reddish orange semi-collar. No trace of dark line on head or back.

Soela bessie: 38. Perfectly adult male. Teysmann, 1877. Like N°s. 1 and 2. — 39. Perfectly adult male. Teysmann, 1877. *Albino.* Semi-collar like N°s. 36 and 37. A nearly invisible trace of a line on the back. — 40. Young female. Hoedt, Nov. 1864. Like N°. 29.

Obi: 41 and 42. Adult females. Bernstein, July 1862. *Obi besar:* Colored like N°. 9, but underparts pure white. — 43. Not fullgrown male. Bernstein, 1866. Upperparts of back and tail and outerside of legs of a reddish brown grey with a silvery tinge, turning towards the nape to a rich red; underparts reddish white; underparts of tail rich red: on the back a few dark-brown patches. — 44. Not fullgrown male. Bernstein, August 1862. Captured on the top of the mountain in *Obi lattoe.* Upperparts and flanks of a brilliant black chocolate brown; hind-legs less dark; fore-legs, sides of neck and underparts of tail redder; head and tail above brown; hands and feet black; underparts and uppermost part of inner side of legs pure white; white ear-patch inconspicuous. — 45. Adult female. Bernstein, August 1862. Of a reddish chocolate brown; underparts and innerside of legs pure white; a white line occupies the underside of the tail. — 46. Younger male. Bernstein, July 1862. Middle of back brownish yellow; back for the rest straw-colored like head, tail and outerside of legs; underparts and innerside of legs white. — 47. Young female, young of the mother N°. 41. Bernstein, July 1862. *Obi besar.* Somewhat darker colored than the mother; hands and feet black.

Halmahera: 48. Adult male. Bernstein, January 1863. *Kia.* Like N°. 43, but the dark brown patches are very large and numerous; a small pure white line occupies the middle of the abdomen. — 49. Young specimen. Bernstein, August 1861. *Galela.* Like N°. 48, but instead of dark patches there are several pure white spots on back, nape and flanks.

Batchan: 50. Adult male. Bernstein, January 1861. Back, flanks and outerside of hind legs brownish red, redder towards the shoulders, nape, head and outerside of fore legs; a red semi-collar; tail dirty yellow; underparts white; innerside of legs reddish white; a few pure white small spots are spread on the back. — 51. Younger female. Bernstein, January 1861. Upperparts and outerside of legs greenish with silvery tinge. Reddish semi-collar. Tail brown. Innerside of legs and abdomen white. Several pure white spots on back, flanks and upperparts of neck. — 52. Young specimen. Bernstein, January 1861. Like N°. 7, but on the back a few very indistinctly visible small white spots.

Ternate: 53. Nearly fullgrown male. Bernstein, April 1861. Like N°. 50. — 54 and 55. Halfgrown males. Bernstein, April 1861. Like N°: 34; back with a few white spots. — 56. Halfgrown individual. Van Musschenbroek, 1878. Like N°. 48, but spotted with white instead of with brown.

Morotai: 57. Adult male. Bernstein, 1862. Upperparts, flanks, tail and hind-legs reddish brown, redder towards the neck above and the outerside of fore-legs; semi-collar red. Underparts whitish red, the middle of the abdomen and between the fore-legs pure white. *All* the upper- and underparts are densely covered with numerous pure white spots, giving the animal an incomparably magnificent aspect. — 58, 59 and 60. Younger females and male. Bernstein, 1862. Colored like N°. 9; underparts however reddish; flanks and upperparts ornated with white spots. — 61 and 62. Young specimens. Bernstein, 1862. Like N°. 7; underparts reddish white; a small line on the middle of the abdomen from between the fore-legs white; a red semi-collar. — 63. Very young individual. Bernstein. Colored like N°. 5; underparts and semi-collar like N°s. 61 and 62; a few nearly inconspicuous small white spots on back and flanks.

Guebeh: 64. Young female. Bernstein, February 1863. Hindparts of back and hind-legs brownish red, fore part of back, nape and crown of head golden red; fore-legs, underparts and tail reddish white; face, hands and feet greyish.

Misool: 65. Perfectly adult male. Hoedt, May 1867. Like N⁰. 41. — 66. Perfectly adult male. Hoedt, June 1867. Colored like N⁰. 19. — 67. Halfgrown male. Hoedt, August 1867. Like N⁰. 7. — 68. Young male. Hoedt, May 1867. Like the foregoing number; hindpart of back, tail and semi-collar reddish. — 69 and 70. Young male and female. Hoedt, May 1867. Back and nape brownish red; flanks, legs, face and tail reddish grey; underparts white. — 71. Very young female. Hoedt, August 1867. Like N⁰. 7, but less dark.

Salawatti: 72. Perfectly adult male. Von Rosenberg, June 1869. Like N⁰. 65.

New-Guinea: 73. Very young individual. Frank, 1878. Like N⁰. 7; a reddish brown semi-collar.

Jobi or *Jappen:* 74. Perfectly adult male. Von Rosenberg, April 1869. Back of a soft brownish red tinge, redder towards nape, head and fore-legs; a red semi-collar; underparts, hind-legs and tail dirty white. — 75. Halfgrown female. Von Rosenberg, April 1869. Like N⁰. 7, but hindpart of back red-brown. — 76. Young male. Von Rosenberg, April 1869. Like N⁰. 69; underparts dirty white.

Soëk: 77. Young male. Von Rosenberg, March 1869. Like N⁰. 45.

Goram: 78 and 79. Perfectly adult males. Von Rosenberg, September 1865. *Albinos*, with a reddish yellow semi-collar. — 80. Not fullgrown male. Von Rosenberg, September 1865. *Albino*, with a reddish yellow semi-collar and a feeble brownish band on the middle of the forehalf of the back. — 81, 82 and 83. Nearly fullgrown females. Von Rosenberg, September 1865. Colored like N⁰. 65. — 84. Halfgrown male. Von Rosenberg, September 1865. Like N⁰. 19, but no semi-collar. — 85. Young male. Von Rosenberg, 1865. Like N⁰. 5; underparts white. — 86. Very young individual. Von Rosenberg, 1865. Like N⁰. 7.

Key-islands: 87. Young female. Von Rosenberg, August 1865. Like N⁰. 71.

Arou-islands: 88. Halfgrown male. Von Rosenberg, May 1865. *Wonoembai.* Colored like N⁰. 33. — 89. Very young female. Von Rosenberg, June 1865. *Wonoembai.* Upperparts, head, tail and legs of a light reddish brown with a silvery tinge on the back. Underparts white.

Besides the above registered mounted specimens there are several very young individuals preserved in spirits in our collection.

Cuscus celebensis.

1858. *Cuscus celebensis* Gray. P. Z. S. L. p. 105. Pl. LXII (partim).

Dr. Gray described this species (1858) in the following terms: »Ears produced beyond the fur, naked internally. »Male and female alike, ashy-grey, grizzled with silvery »hairs; the nape and the upper part of the middle of the »back blacker. but *without any distinct dorsal streak* [1]).

» *Cuscus celebensis*, Brit. Mus.

» *Hab.* Celebes.

»We have of the species —

1. Young animal, from the *island* [1]) of Macassar; pro»cured from Mr. J. R. Wallace in 1851.

2. Adult male and female. from San Cristoval. *So»loman* [1]) Group of Islands, Dec. 1855. Presented by John »Macgillivray, Esq. and T. M. Rayner, Esq. in 1856.

»The same author wrote in 1860 [2]): » *Cuscus ornatus* »differs entirely from *C. celebensis* (*from Celebes* [1]) in the »general colour of the fur, and in having *a distinct streak* »*on the head and back* [1]), somewhat like the streak on the »back of the female *C. orientalis*, but narrower and darker."

Gray in »Additional observations on the genus Cus-

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1) I write this in Italics.
2) P. Z. S. L. p. 2.

cus 1)" said: »*Cuscus* (*Strigocuscus*) *celebensis*, Gray. P. Z. S. 1858. p. 105. t. 62.

»*Hab.* St. Cristoval, *Solomon's* 2) Group of Islands. We
»have both sexes in the British Museum Collection, and
»the skulls of two others nearly adult, collected by Mr. Ray-
»ner and Mr. J. Macgillivray during the voyage of the
»Herald". There is very little difference between the two
»skulls though they are from a male and female animal.

»In the description of the species in the paper above
»referred to, the animal is erroneously said, *by a slip of*
»*the pen* 2), to have *no dorsal streak* 2). We have in the
»British Museum a young specimen of a *Cuscus* from Ma-
»cassar, which is very like *C. celebensis*, but it has *no*
»visible *dorsal streak* 2): it is not in a very good condi-
»tion. It may be a variety of this species, or the young
»of one of the other, or perhaps an undeveloped state of
»a new one".

And in the same paper we read on p. 321: »The other 3)
»was sent by Mr. Wallace from Macassar in 1857 and is
»a young male. I formerly considered it as a variety of
»*C. celebensis* (P. Z. S. 1858. p. 43 4)); and it is like that
»species in several particulars; but the *want of the dorsal*
»*streak* 2) is a *great peculiarity* 2), which was not so dis-
»tinctly seen before it was stuffed."

Every one will agree with me that, without sufficient materials, it may be called hopeless efforts to find and hold the thread in such a labyrinth of bad descriptions, contradictions and inexactness, mixed with a very accidental *slip of the pen* and crowned with a *may be* embracing all the species imaginable!

There are living in Celebes two species of *Cuscus*, viz: *C. ursinus* and a species quite distinct from this and from

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1) P. Z. S. L. 1861. p. 319.

2) I write this in Italics.

3) Of two young specimens of the genus which Gray was not able to determine with certainty.

4) Not p. 43 but p. 105.

the two other species of the genus and shortly described by Gray in 1858 after a young specimen from Wallace's voyage to Celebes. This species is *without dorsal streak* and has nothing to do with the two specimens from the Salomon-islands (one of the most eastern localities where ever a *Cuscus*-specimen has been found): the latter two have a dorsal streak and belong to *Cuscus orientalis* Pallas. This young specimen from Celebes is the type of *Cuscus celebensis* Gray. In rejecting this specimen in 1861, Gray was obliged to name a *Cuscus* from the very distant Salomon-group, *Cuscus celebensis*! The specimen sent by Wallace from Macassar in 1857 is a young male of the same species and therefore the *want of the dorsal streak* in that specimen is not such a great peculiarity as Gray believed. The year 1851 is somewhat suspect, for Mr. Wallace has been three times in Celebes: twice in Macassar, viz: from Sept. to Nov. 1856 and from July to Nov. 1857, and once in Menado, viz: from June to Sept. 1859 [1]).

Description of the species: No difference in color between male and female. Ears large, produced beyond the very soft fur, naked internally, clothed with long hairs externally, the border of the ear however naked. Upperparts of head and body, outerside of legs and the hairy part of tail ashy grey, the hairs being generally silvery tipped; sometimes there is on the back a darker shade, but *never a distinct dorsal streak* [2]). Lowerparts of head and body and innerside of legs pure white or with a slightly ashy tinge. All the hairs are long, woolly and very soft to the touch.

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1) The malay Archipelago. London. 1869. It is a pity that we are *in dubio* as to the exact locality where Wallace gathered the specimens. It now is questionable if the species is restricted to Northern Celebes or is spread over the whole island.

2) The figures ♂ and ♀ (plate 62, P. Z. S. L. 1858) probably having been drawn after the two specimens from the Salomon-islands represent not *Cuscus celebensis* but *Cuscus orientalis*. *Cuscus celebensis* is a much smaller and generally less dark colored species. Therefore the figures agree not with Gray's description.

The form of the skull (there are three skulls in our collection) agrees with that of a half-grown *Cuscus orientalis:* concave between the orbits, elevated crests or ridges bordering this cavity like in that species, but the cavity is less deep. The number of the teeth in upper- and lower jaw agrees with that of the same parts in *Cuscus ursinus* and *Cuscus maculatus*; the hindmost upper incisor is nearly as high as the canine; the canine and the anterior upper premolar are separated from each other and from the hindmost incisor and the second premolar by rather wide and nearly equal spaces. The dental formula is: I. $\frac{3}{1}$, C. $\frac{1}{0}$, P. $\frac{2}{3}$, M. $\frac{4}{4}$.

Concluding from the form of the orbital ridges I cannot believe that we possess the fullgrown state of the animal. Our largest specimen agrees in size with a very adult *Pseudochirus albertisii.*

Hab. Celebes: Menado (van Musschenbroek, von Rosenberg, von Faber), Macassar? (Wallace, after Gray).

Mounted specimens in the Leyden Museum:

1, 2 and 3. Fullgrown male and females. North-Celebes, Amoerang. Presented in 1883 by Mr. F. von Faber. — 4 and 5. Younger males. North-Celebes, Menado. Presented in 1878 by Mr. S. C. J. W. van Musschenbroek.

We know nothing about its habits. According to Mr. van Musschenbroek it is called *Temboeng* by the indigenous.

Cuscus maculatus.

1803. *Phalangista maculata* Is. G. St. Hilaire. Catalogue du Muséum. p. 149.

1820. *Phalangista papuensis* Desmarest. Mammalogie, Suppl. p. 541.

1824. *Phalangista Quoy* Quoy et Gaimard. Voyage de l'Uranie. Zoologie. p. 58. pl. 6; *Phalangista maculata* Quoy et Gaimard. l. c. p. 59. pl. 7, et pl. 8. figs. 1, 2, 3, 4, 5 1).

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1) Pl. 8, fig. 6 represents the skull of a young *Cuscus orientalis* and not

1826. *Cuscus maculatus* Lesson et Garnot. Voyage de la Coquille. Zoologie. I. p. 150. pl. IV; *Cuscus macrourus* Lesson et Garnot. l. c. p. 156. pl. V.
1827. *Phalangista chrysorrhos* Temminck. Mammalogie. T. I. p. 12. Pl. I, figs. 4, 5, 6; Pl. III, figs. 1, 2, 3, 4, 5.
1846. *Phalangista (Cuscus) chrysorrhos* Waterhouse. Marsupiata. Vol. I. p. 271; *Phalangista (Cuscus) maculata* Waterhouse. l. c. p. 274; *Cuscus macrourus* Waterhouse. l. c. p. 277.
1849. *Phalangista nudicaudata* Gould. P. Z. S. L. p. 110.
1858. *Cuscus brevicaudatus* Gray. P. Z. S. L. p. 102.
1861. *Cuscus (Eucuscus) brevicaudatus* Gray. P. Z. S. L. p. 316; *Cuscus (Spilocuscus) chrysorrhos* Gray. l. c. p. 317; *Cuscus (Spilocuscus) maculatus* Gray. l. c. p. 318.
1866. *Cuscus maculatus*, var: *ochropus* Gray. P. Z. S. L. p. 220.
1881. *Phalangista (Cuscus) maculata* Peters e Doria. Ann. Mus. civ. Gen. XVI. p. 21.

Sexes differently colored; males spotted, females without spots. Ears short, hidden by the fur, externally and internally densely clothed with long hairs. Dental formula: I. $\frac{3}{1}$, C. $\frac{1}{0}$, P. $\frac{2}{3}$, M. $\frac{4}{4}$.

All the authors writing] on this species have followed Waterhouse and overlooked that Is. Geoffroy St. Hilaire described it, several years before Desmarest wrote, in the following excellent way: »Le Phalanger tacheté. *Phalangista maculata*. *Caract.* Pelage blanchâtre, tacheté de brun; »deux incisives latérales à la mâchoire inférieure. *Descript.* »Pelage des parties supérieures du corps d'un blanc-jaunâtre tacheté de brun; les deux dents latérales d'en haut »très-grandes et triangulaires, remplissant presque l'inter-

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that of a young *Cuscus maculatus*. This pl. 8 is a copy of Temminck's plate, hence the same mistake (cf. Quoy et Gaimard. l. c. p. 60).

»valle existant entre les incisives et les molaires; oreilles »velues à leur intérieur, comme à l'extérieur; les ongles »très-petits. *Patrie*. Les Moluques."

This is the first and at the same time a very exact description of a male specimen.

Quoy and Gaimard described and figured a male [1]) from Waigeou, s. n. *Phalangista Quoy* (Desmarest had described the same specimen under the name *Phalangista papuensis*) and a younger male from the same island s. n. *Phalangista maculata* [2]).

In »le Voyage de la Coquille" have been described and figured an adult male, s. n. *Cuscus maculatus*, with a very good figure of its skull and a younger specimen, s. n. *Cuscus macrourus* (femelle), both from Waigeou.

Temminck described the female-stage, s. n. *Phalangista chrysorrhos*, after two adult specimens from the Moluccas, and the mode of coloring in the males, adult and young, s. n. *Phalangista maculata*, after individuals from Banda and Amboina. Finally he figured the skull of the fullgrown in several positions. Temminck's figure of the skull of a young *Cuscus orientalis*, which he called that of a young *Cuscus maculatus*, induced Waterhouse to state that in the young of the latter species there are in the lower jaw, between the great incisors and the principal premolar, three small teeth, and in the adult two on either side. As to *Cuscus macrourus* Lesson et Garnot, Waterhouse says, that it would appear that it resembles the young of *C. maculatus*.

A female, two-thirds grown, from Cape York and belonging to the species under consideration has been des-

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1) Regarding this specimen Mr. Huet of the Paris Museum kindly informs me: »le *Phalangista Quoyi* est en mauvais état, mais cependant je suis disposé à croire que c'est un mâle, quoique la peau des testicules soit introuvable, d'autre part il n'y a pas apparence de poche et l'on trouve un petit bouton qui me paraît être l'enveloppe du pénis; pas de renseignements à ce sujet ni sur le plateau ni sur les catalogues."

2) Mr. Huet writes: »Quant au *Phalangista maculata* il n'y a aucun doute. C'est bien un mâle."

cribed by Gould, s. n. *Phalangista nudicaudata.* Gray considered it a good species, but baptized it *Cuscus brevicaudatus* and classified it three years later in his section *Eucuscus.* Four females (of *Cuscus maculatus*) from Ceram and from the South coast of New-Guinea he considered to belong to *Spilocuscus chrysorrhos;* an adult and a half-grown male, both spotted, and from New-Guinea, he brought under the named head with the supposition »that they may belong to *Spilocuscus maculatus*" (and in this Gray was quite right). Two adult males from Waygeroo (Waigeou) and Aru-Island and an adult male and female from Waygeroo (Waigeou) he considered to belong to *Spilocuscus maculatus.*

Under the name *Cuscus maculatus*, var. *ochropus* Dr. Gray described a male (apparently a young male of *Cuscus maculatus*) and a female (exactly agreeing with Temminck's *Phalangista chrysorrhos* and therefore a true female of *Cuscus maculatus*) from North-Australie, Port Albany. That Gray had not the slightest idea of the extremely great variability in the mode of coloring in the individuals of *Cuscus maculatus* may appear to every one who takes the trouble to read the discussion by that author in 1866 (P. Z. S. L. p. 220).

Prof. Peters shortly described (1881) a series of specimens collected by Beccari, d'Albertis and Bruyn from Waigeou, Arou, Key, New-Guinea and from the islands in the bay of Geelvink. I remark that a female collected by Bruyn in Waigeou is colored like the male-specimens.

The unequalled material at my disposal permits to trace in short lines the typical color of male and female; in my summing up of the specimens preserved in our Museum I will endeavour to give a short description of every specimen if need be.

Male. Head, upperparts, clothed part of tail and outerside of legs white, irregularly spotted with red, brown or black. Lowerparts and innerside of legs white.

Female. Head, upperparts, sides of body and outerside of legs black, brown or red, the hairs always tipped with white, bright brown or bright red. Clothed part of tail whitish, brownish or reddish, darker towards the rump. Lowerparts and innerside of legs white; brownish or reddish towards the base of the tail and in the region of the pouch. Generally a distinct black band separates the white abdomen from the darker sides of the body.

It must be observed that always the females are larger in size and bigger than the males and that the young males are colored like the adult ones and the young females like the adult females.

A highly interesting and very difficultly explicable fact is, that, meanwhile constantly the males are spotted and the females not, the females living in Waigeou seem to have constantly the coloring of the males specimens. Lesson and Garnot's *Cuscus macrourus* (femelle) from Waigeou is the first exemplar of this kind; Gray enumerated a spotted female from Waygeroo (Waigeou), from Wallace's voyages; Peters cited a spotted female collected by Bruyn in Waigeou; finally in our collection there are two spotted females from Waigeou, collected by Bernstein. It seems that up to this time nobody has been struck by this very surprising phenomenon. A description of the Waigeou-specimens will be found hereafter. A careful comparative study of the skulls of the named specimens from Waigeou in our collection led me into the following observations: the size and shape of the four (2 ♂ and 2 ♀) skulls before me correspond exactly with the size and shape of other skulls of perfectly adult specimens from other localities and in our collection, but the dentition is very peculiar. 1rst male, *upper jaw:* the second left molar wants, no trace of follicle, a small interval between first and third molar; *lower jaw:* three small premolars in each jaw. 2nd male, *upper jaw:* between canine and large premolar a very small and acutely pointed premolar 1); *lower jaw:*

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1) Cf. the figure of the skull of *Cuscus maculatus* (pl. 4) in „le Voyage de la Coquille."

right jaw with three small premolars, the hindermost very small and acutely pointed; left jaw with two small premolars. 1rst female; *upper jaw:* a small and acutely pointed premolar between the canine and the large premolar on each side; *lower jaw:* right jaw with two small premolars, left jaw with three small premolars, the hindermost being the less developed. 2nd female, *upper jaw:* a small pointed premolar between canine and large premolar, closely crowded to the latter; *lower jaw:* right jaw with four small premolars, the two hindermost exceedingly minute and very closely crowded together; left jaw with three small premolars, the hindermost minute and pointed. The minute size and pointed shape of the superfluous premolars induce me to believe that they are spurious. As the skulls belong to perfectly adult specimens I incline to accept that the apparition of spurious teeth is a peculiarity of advanced age; and this indeed is a very interesting fact as it just is the contrary of what we generally observe in other groups of Mammals.

The skeleton presents 13 costales, 6 lumbares, 2 sacrales and 31 caudales. There are in our collection four skeletons (adult and young) and about forty skulls belonging to differently aged specimens of the species under consideration. For details see page 90.

Hab: Saleyer-islands (Teysmann). Amboina (Reinwardt, Hoedt, Bernstein, Teysmann). Banda (vide Temminck's Mammalogie). Ceram (Forsten, Hoedt, Wallace). Poeloe Pandjang (v. Rosenberg). Khoor (v. Rosenberg). Tyoor (v. Rosenberg). Key-islands (v. Rosenberg, Beccari). Arou-islands: Wammer, Wokam, Wonoembai, Maykoor (v. Rosenberg, Wallace, Beccari). Salawatti (v. Rosenberg). Misool (Hoedt, v. Rosenberg). Batanta (v. Rosenberg). Waigeou (Quoy and Gaimard, Lesson and Garnot, v. Rosenberg, Bernstein, Wallace, Bruyn). New-Guinea (Macklot and Müller, Jukes, Macgillivray, v. Rosenberg, Beccari, d'Albertis). Mefoor (v. Rosenberg, Beccari and Bruyn). Jobi or Jappen (v. Rosenberg, Beccari and Bruyn). Meosnoum

(v. Rosenberg, Beccari). Schouten-islands: Soëk and Biak (v. Rosenberg, Beccari). Echiquier-islands (Alfred Tetens). Dufour-island (Macgillivray). Australia: Cape York (Macgillivray), Port Albany (Coxen).

According to Quoy and Gaimard this species is called *Rambave* in Waigeou, *Do* in Guébé and *Couscous* in Amboina. They state »il ne paroît pas difficile à prendre, car »les naturels nous en apportoient assez souvent des indi»vidus enfermés dans des cages de bambous." As this species bears an indigenous name it is very probable that it is to be found in Guébé, although I never saw a specimen from this locality. Lesson and Garnot relate: »Le »grand phalanger tacheté (*Cuscus maculatus*, *major*) est »très-commun dans cette île (Waigeou) où les naturels le »nomment *Scham-Scham*. Remarquable par son épaisse four»rure laineuse, blanchâtre, que recouvrent des taches ar»rondies d'un noir vif; par sa face rouge, ses yeux car»mines, enveloppés d'un rebord palpébral lâche; cet animal, »qui n'a point une physionomie agréable, voit à peine pen»dant le jour, tandisque, au contraire, sa pupille, con»tractée et verticale sous l'influence de la lumière, se dilate »au soir et pendant la nuit" and that: »plusieurs individus »nous furent vendus par les naturels de ces contrées: nous »essayâmes de les conserver en vie, mais ce fût sans succès. »Leurs habitudes étaient lentes et taciturnes. Ils léchaient »sans cesse la partie dénudée de leur queue, et les mains, »avec lesquelles ils se frottaient presque continuellement la »face. Leurs grands yeux rouges, surmontés d'un épais »rebord formé par les paupières, donnaient à ces animaux »une physionomie stupide. Ils buvaient beaucoup, man»geaient du pain, qu'ils prenaient avec leurs mains, pré»féraient la viande, se battaient avec fureur lorsqu'on en »mettait deux ensemble, grognaient comme des chats pour »peu qu'on les inquiétât, et cherchaient à mordre, en »saisissant avec les mains ceux qui les agaçaient."

After v. Rosenberg 1) it is called *Wangal* in Arou and

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1) Der Malayische Archipel. 1878. p. 361.

Muder or *Medar* in Key and Khoor. He further says: »Das Thier kommt nach Aussage der Eingeborenen weder »auf Tyoor, noch auf den Watubella- und Goram-Inseln »vor; auf den Aru-Inseln ist es sehr häufig und wird da»selbst in verschiedenen Farbenabstufungen angetroffen, »namentlich Grau und Rostbraun, Weiss mit Schwarz und »Weiss mit brandrothen Flecken. Der *Wangal* bringt den »Tag an einem dunklen Ort schlafend zu, wobei er auf »den Hinterfüssen sitzt und mit gekrümmtem Rücken den »zwischen den Vorderpfoten verborgenen Kopf gegen den »Bauch andrückt. Seine Nahrung entnimmt er hauptsäch»lich dem Pflanzenreich, doch frisst er auch gelegentlich »Nestvögel und säuft die Eier aus. In allen Bewegungen »ist er träge, stützt sich beim Gehen auf dem Schwanz, »gleichsam als auf einen fünften Fuss, ist stumpfsinnig »und bissig und darum schwer zu zähmen. Die Eingebo»renen essen das Fleisch gerne."

The indigenous name in New-Guinea is *Inggairun* or *Inggeinoe*, in Andai *Medunga*, in Jappen or Jobi *Midungjen*, in Misool *Kahpa* 1). Von Rosenberg adds: »Ueberall häufig in variirenden Farbenkleidern."

The indigenous name in the Saleyer-islands is *Tjempaoesan* (Teysmann); in Amboina *Koesoe pontai* (♂), *Koesoe nēla* (♀) according to Teysmann's labels.

Mounted specimens in the Leyden Museum:

Saleyer-islands: 1. Adult male. Teysmann, 1878. The spots are brown on the nape of the neck and foremost part of back, darker towards the rump, chocolate-brown on the legs, reddish on the tail; ears white. — 2. Perfectly adult female. Teysmann, 1878. Exactly colored like *Phalangista chrysorrhos* Temm. (See Mammalogie, T. I. p. 13). — 3. Very young female, young of the mother N⁰. 2. Teysmann, 1878. Nape of neck, back, flanks, legs and tail of a pretty slaty black, head and ears brownish, lowerparts and inner-side of legs pure white.

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1) Der Malayische Archipel. 1878. p. 549.

Amboina: 4. Perfectly adult male. Macklot, Sept. 1828. Colored like N°. 1. This individual was sent over in spirits and afterwards has been stuffed, therefore the white color turned in a dirty yellow. — 5. Perfectly adult male. Hoedt, March 1863. Colored like N°. 1, the spots are darker, tail unspotted, head chocolate-brown. — 6. Perfectly adult male. Teysmann, 1877. Like the former; tail near the end of the clothed part with a red spot. — 7. Adult male. Teysmann, 1877. From between the eyes till behind the nape of the neck the hairs broadly tipped with white, for the rest like N°. 1. — 8. Nearly fullgrown male. Hoedt, Nov. 1866. Face, nape of the neck and spots on legs chocolate-brown, crown of head silvery, for the rest like N°. 5. — 9. Young male. Teysmann, 1877. Like N°. 5, but generally more grizzled. — 10. Young male. Hoedt, August 1866. Face, nape of neck, spots on legs reddish brown, crown of head broadly white tipped, spots on back and flanks brown, tail yellowish white. — 11. Very young male. Hoedt, July 1863. The brownish spots on back and legs indistinctly visible, caused by the nebulous tinge of the broadly white tipped hairs. — 12 and 13. Adult females. Reinwardt. Type-specimens of *Phalangista chrysorrhos* Temm. — 14. Perfectly adult female. Teysmann, 1877. — 15. Adult female. Hoedt, Nov. 1863. — 16. Young female. Teysmann, 1877. N°s. 12, 13, 14, 15 and 16 similarly colored. — 17. Very young female. Macklot, Sept. 1828. By the action of spirits in which it has been sent over, the upperparts have turned reddish brown and the underparts, inner-side of legs and tail dirty brown.

Ceram: 18. Adult male. Hoedt, April 1863. The dark spots are so large that it gives the impression as if the back and flanks are black with white spots; face, nape of neck and legs chocolate-brown; breast and tail more reddish with white spots, underparts pure white. — 19. Young male. Forsten. Like N°. 4, but somewhat redder.

Poeloe Pandjang: 20. Perfectly adult female. Von Rosenberg, Sept. 1865. Colored like N°s. 12 and 13.

Khoor: 21. Young male. Von Rosenberg, Sept. 1865. Colored like N°. 11, but still whiter; face brownish white.

Key-islands: 22. Perfectly adult female. Von Rosenberg, August 1865, *Great-Key*. Colored like Nos. 12 and 13.

Arou-islands: 23. Adult male. Von Rosenberg, July 1865, Maykoor. Colored like N°. 5, foremost part of back grizzled, some red spots on the legs. — 24. Young male. Von Rosenberg, April 1865, Wokam. Spotted with reddish brown; on the hindmost part of the back however with blackish brown spots. Head and tail reddish. — 25. Perfectly adult female. Von Rosenberg, 21 May 1865, Wonoembai. Colored like Nos. 12 and 13, but ears and rump golden-yellow, hands and feet red-brown. — 26. Adult female. Von Rosenberg, 27 May 1865, Wonoembai. Colored like N°. 25, but upperparts and fore-legs whiter. — 27. Young female. Von Rosenberg, 20 May 1865, Wonoembai. Head, back, flanks and outerside of legs red-brown, tail yellowish-red; no black line separates the red-brown colored flanks from the white abdomen.

Misool: 28. Perfectly adult male. Hoedt, May 1867. All the not white colored parts of a brilliant rich golden color, sooty black on the hindmost part of the back, redder on the hind legs, face, hands and feet. — 29. Halfgrown male. Hoedt, May 1867. Colored like the former, but back less black. — 30. Young male. Hoedt, June 1867. The spots of a dull red-brown, head of a dirty black washed with brown. — 31 and 32. Perfectly adult females. Hoedt, May and June 1867. Back and flanks sooty; face (the face of N°. 32 is injured and its skull wants), hindlegs, hands and feet of a brilliant golden red; nape of neck, shoulders, fore-legs and tail of a rich golden yellow.

Batanta: 33. Young male. Von Rosenberg, June 1869. Colored like N°. 30.

Waigeou: 34 and 35. Perfectly adult males. Bernstein, March 1863. Spotted parts of back, flanks, and hind-legs of a glistening black, of nape of neck and fore-legs reddish black; head and border of ears of a brilliant golden red; spots on tail brown. — 36. Young male. Bernstein, March 1863. Colored like N°. 11, the spots on tail and fore-legs however with reddish, face brownish red. — 37 and 38. Perfectly adult females. Bernstein, April 1863. Colored and spotted like the males N°s. 34 and 35, the only difference being that the spots on the fore-legs and on the nape of the neck are colored like the back. The underparts are pure white; in N°. 37 however red round the pouch, slightly red in N°. 38.

New-Guinea: 39. Perfectly adult male. Presented by Mr. v. Musschenbroek, 1878. Of the same splendid color as N°. 28. — 40. Nearly adult male. Müller and Macklot, August 1828, bay Lobo. Colored like N°. 22. — 41. Nearly adult male. Presented by Mr. v. Musschenbroek, 1874. Colored like N°. 4. — 42. Male. Presented by Mr. v. Musschenbroek, 1873, Doreh. The spots are of a very light red tinge, giving the impression as if the animal is entirely white colored. Perhaps an albino. — 43. Adult female. Von Rosenberg, 1870, Andai. Midmost part of back sooty black; head, outer-side of hind-legs, hands and feet brilliant red; four spots on the fore part of the back and the area round the pouch red-brown. Back for the rest yellowish white like the tail and the outer-side of fore-legs; the underparts pure white.

Jobi or *Jappen:* 44. Nearly adult male. Von Rosenberg, April 1869. Colored like N°. 29.

Mefoor: 45. Younger female. Von Rosenberg, January 1869. Colored like N°. 27.

Echiquier-islands: 46. Young male. Museum Godefroy, Hamburgh, 1869. Collected by Captain Alfred Tetens. Head, ears, hands, feet and spots on tail and on outerside of legs red; spots on back and nape of neck brownish-red. — 47. Adult female. Museum Godefroy, 1869. Collected by Captain Alfred Tetens. Tail injured. Crown of head, nape of neck, back and flanks sooty red; face and legs red; ears and tail yellowish red; underparts like in other females.

Australia: 48. Young male. Port Albany, Frank, 1867. Colored like N⁰. 11, but somewhat darker. — 49. Young male. Salmin, 1867, Cape York. Colored like the former specimen, but face, hands and feet grey.

92. A young female from the Moluccas, labeled *Phalangista ursina* by Temminck. Colored like N⁰. 17.

There is in our collection a single young individual from Ceram preserved in spirits.

Cuscus ursinus.

1827. *Phalangista ursina* Temminck. Monogr. de Mammalogie. I. p. 10. pl. 1. figs. 1, 2, 3; pl. 2. figs. 1, 2, 3, 4, 5; pl. 4.

No difference in color between male and female. Ears short, almost hidden by the hairs of the head, externally and internally densely clothed with rather long hairs. For further external characteristics of the species see the detailed descriptions by Temminck and Waterhouse.

Skeleton very stout in proportions: there are 13 costales, 6 lumbares, 2 sacrales and 31 caudales.

The form of the skull agrees much more with that of *Cuscus orientalis* than with that of *Cuscus maculatus*, it is however relatively less broad. The number of teeth in upper and lower jaw agrees with that of the same parts in *Cuscus maculatus*, all the teeth however are stronger developed, especially the foremost upper-, the two anterior lower premolars and the upper incisors; the second upper incisor is not broad like in the other species of the genus *Cuscus*, but very long, nearly as long as the hindmost upper incisor, which has about three fourth the length of the foremost upper premolar. The upper canine is placed exactly between the incisor and the premolar with only small intervals. The dental formula is: I. $\frac{3}{1}$, C. $\frac{1}{0}$, P. $\frac{2}{3}$, M. $\frac{4}{4}$.

Hab.: Celebes: Menado (Reinwardt, von Rosenberg, von Faber).

The well known explorer v. Rosenberg[1]) says that the indigenous name is *Bubutu* and he proceeds as follows: »Es ist kein Nachtthier im eigentlichen Sinne »des Wortes, denn ein von mir lange Zeit in Gefangenschaft gehaltenes Exemplar schlief bei Tag nur selten. Näherte sich Jemand seinem Behälter, so liess es »einen eigenthümlichen schmatzenden Laut hören, wobei »die Unterlippe in eine zitternde Bewegung gerieth. Träge »und bedächtig in allen Bewegungen, sass es öfters in aufrechter Stellung auf den Hinterbeinen, nahm die Speise, »die ihm gereicht wurde, mit den Vorderpfoten und brachte »sie damit zum Munde, um sie zu verzehren. Sie bestand »aus gekochtem Reiss, Früchten und Baumblättern. Das »Thier ist ziemlich allgemein in den Wäldern und wird »häufig von den Eingeborenen, welche gern sein Fleisch »essen, in Schlingen gefangen."

Mounted specimens in the Leyden Museum:

1. Adult male. North-Celebes. Reinwardt. — 2 and 3. Adult females. North-Celebes. Reinwardt. — 4. Adult male. North-Celebes, Menado. Presented in 1883 by Mr. F. von Faber. — 5. Young female. North-Celebes, Gorontalo. Von Rosenberg, 1 July 1864.

Our collection contains three young specimens in spirits, two skeletons of adult individuals and two skulls.

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1) Der Malayische Archipel. 1878. p. 268.